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(71) Applicant(s)

Jan De Kesel  
J B Lombaertdreef 21, B-9810 Drongen, Belgium

(72) Inventor(s)

Jan De Kesel

(74) Agent and/or Address for Service

Brookes & Martin  
High Holborn House, 52-54 High Holborn, LONDON,  
WC1V 6SE, United Kingdom

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(56) Documents Cited

EP 0638851 A2 EP 0631207 A2 US 5296902 A  
US 5177540 A US 5110646 A

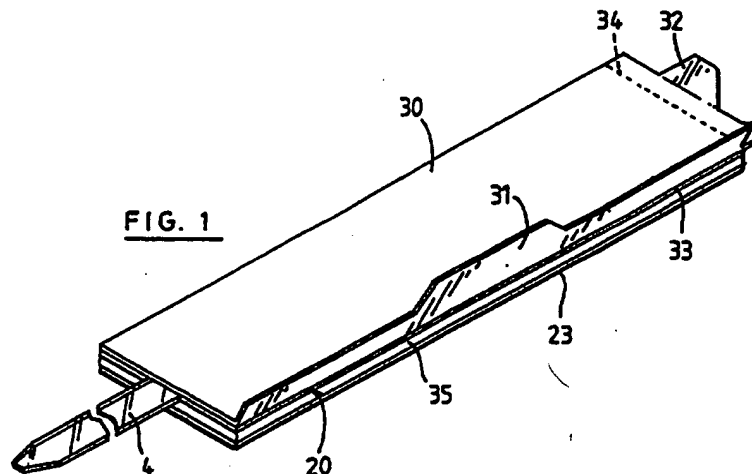
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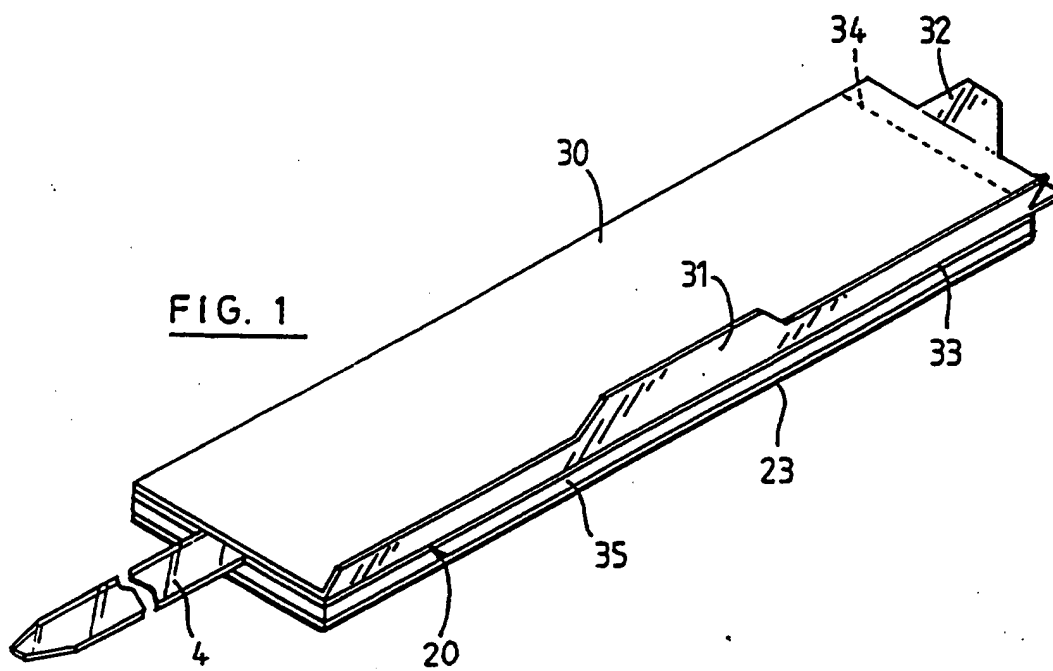
**Seal for a toner cartridge assembly and a process of re-charging a toner cartridge using such a seal**

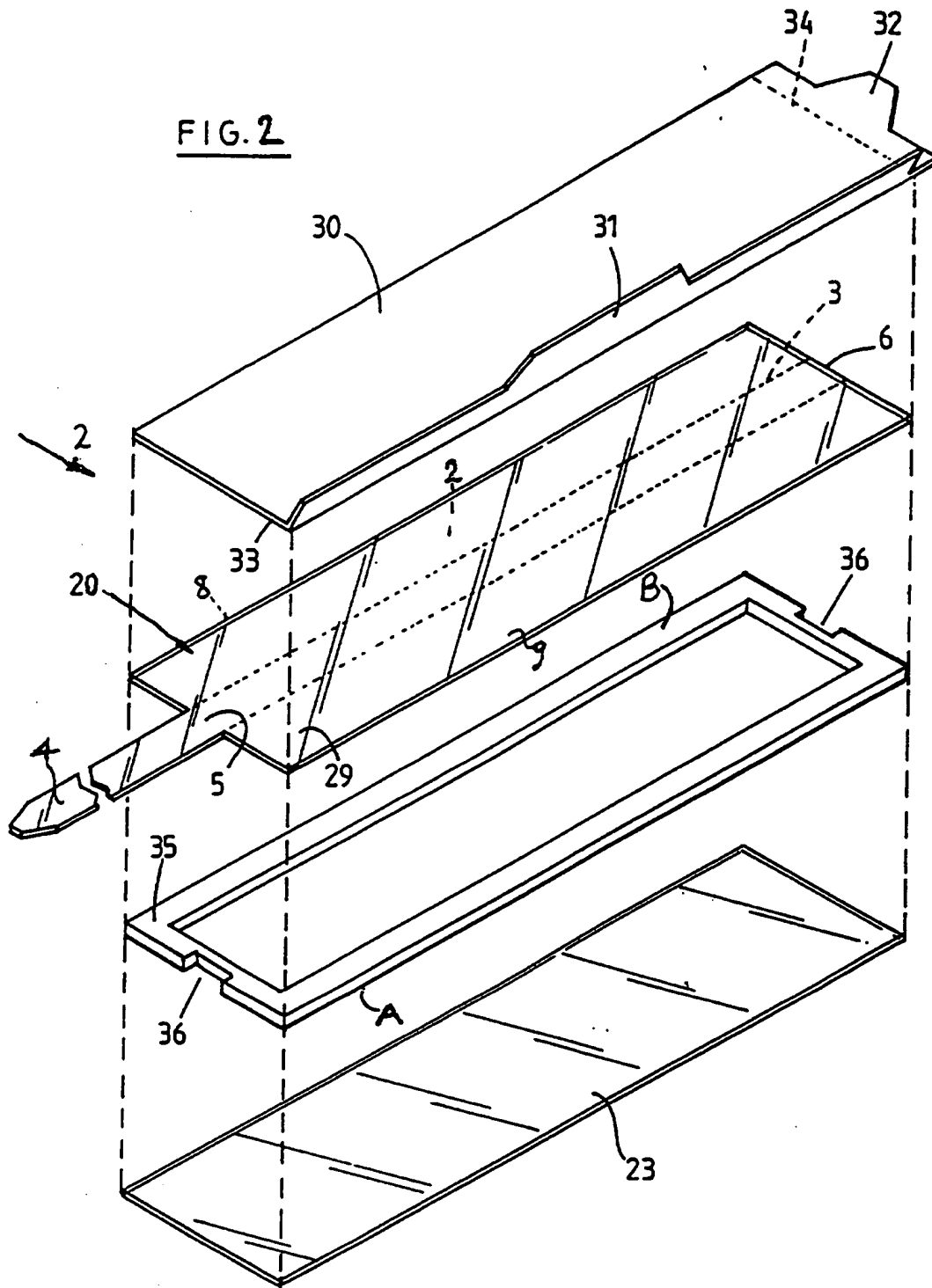
(57) A seal (2) for a toner cartridge used in printers, copying machines and facsimile machines is composed of a layer (20) intended to close off an opening in the cartridge wall until toner is to be passed through the opening. The layer (20) has a tongue (4) which can be pulled to tear off a central strip (21) of the layer (20) to expose the opening. The layer (20) is bonded on one side with glue to a rigid support (30) used to handle and place the seal onto the cartridge and on the other side to a foam insert (35). The insert (35) has a glue layer (A) which is protected with a peelable layer (23) which bonds with the cartridge wall with a greater strength than the bond between the original support (30) and the rest of the seal (2).



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**SEAL FOR A TONER CARTRIDGE ASSEMBLY AND A PROCESS OF**  
**RE-CHARGING A TONER CARTRIDGE USING SUCH A SEAL**

The present invention relates to a seal for a toner cartridge used in printers, copy machines and facsimile machines and to a process of re-charging a toner cartridge using such a seal. Normally such cartridges have an opening or slot in a wall through which the toner can pass when the seal is broken.

The seal can be in the form of a film with a strip which can be torn out.

Such seals are preferred with respect to the seals disclosed in US 5,296,902 as in the latter seals, it is necessary to manufacture slotted seal inserts having a slot with very accurate dimensions. Furthermore, the film closing the slot is glued to the insert, whereby when peeling the film away from the slot, said slot can be damaged if the insert is not sufficiently rigid. The seals according to this US patent are seals used to permit the recharging of a toner cartridge.

Seals in the form of a film comprising a strip which can be torn out are often used for new cartridges, i.e. not for recharging toner cartridges, but more recently, a seal of this kind has been proposed which is suitable for recharging toner cartridges.

The major drawback of this kind of seal is that when tearing the strip, there is a risk that the film is also partly torn out and extends into the passage of toner.

An object of the present invention is to provide an improved seal for a new toner cartridge assembly as well for a re-used toner cartridge, i.e. a re-charged cartridge.

In one aspect the invention provides a seal usable to permit the re-charging of a toner cartridge of the type used in printers, copy machines and facsimile machines, which has an opening in a wall for allowing the passage of the toner, said seal comprising a layer from which a strip can be torn out so as to expose the opening for the passage of toner with respect to parts of the layer which remain in place, said strip being linked to a grippable tongue to be pulled for tearing the strip from a first end of the strip up to another end of the strip, whereby when the first end of the strip is not pulled so the strip is not torn, the strip prevents the loss of toner from the cartridge, while when the strip is torn up from the first other end to the opening for the passage of toner is formed, said seal having an exposable first glue layer intended to contact the toner cartridge and a substantially rigid support, suitable to place the seal on the toner cartridge and bonded to another part of the seal with another glue layer, whereby the other glue layer exerts a gluing force between the support and the other part of the seal which is lower than the gluing force of the first glue layer between the seal and the toner cartridge, so that after placing and bonding the seal, the support can be removed without damaging the remainder of the seal.

In another aspect the invention provide a process of recharging a toner cartridge of the type used in printers, copy machines and facsimile machines which has an opening in a wall for allowing the passage of the toner which comprises introducing toner into the cartridge through the opening, fixing a seal as aforesaid on to the wall to cause the first glue layer to bond with the wall and seal the opening and then removing the support from the remainder of the seal.

As appears hereinafter a preferred embodiment of a seal for preventing the loss of toner from a cartridge during handling and shipment comprises the aforesaid layer from which the strip can be torn out so as to define an opening for the passage of toner with respect to the parts of the layer which remain intact. The layer is unperforated in its parts intended to remain in place and define the passage for the toner and in its part representing the strip intended to close the passage of toner out of the cartridge. The strip is preferably linked to the gripping element or tongue which is of corresponding length to the strip.

The layer with the strip can be bonded with a further layer of glue to rectangular window-like insert made from foam. The opposite side of the insert is provided with the first glue layer intended to bond onto the cartridge wall. The support fastened with glue with a weaker bonding force to the other face of the layer with the strip can easily be separated when the seal has been installed in place.

According to a specific embodiment, the substantially rigid support is made from cardboard which has a thickness of less than 2 mm, for example comprised between 0.5 and 2 mm.

During use of a seal constructed in accordance with the invention

- preferably the toner roller is removed,
- preferably a protective layer over the first glue layer is peeled off and removed,
- the seal with the support intact is then placed so that the seal is directed
- towards the toner cartridge wall,
- the seal with the support is pushed onto the toner cartridge so
- as to close the opening in the toner cartridge (through
- which toner can flow from the toner cartridge onto the toner
- roller) and so that the seal is glued onto the cartridge, and
- preferably the support is removed.

Details and characteristics of a preferred embodiment of the invention given as example only, will become apparent from the following description and the accompanying drawings.

In these drawings:

Figure 1 is a perspective view of an embodiment of a seal constructed in accordance with the invention and

Figure 2 is an exploded view of the seal shown in Figure 1.

Figures 1 and 2 depict a seal 2 constructed in accordance with the invention which is of multi-layered configuration. In general, the seal 2 is intended to be placed onto a wall of a toner cartridge which has an opening through which the toner can pass when the seal 2 is broken. The seal 2 is intended to be placed between the wall of the toner cartridge possessing the opening and a support for a toner roller. The seal 2 is composed of a layer or film 20 provided with a tongue 4 which can be gripped and pulled to create a separate central strip 21 between lateral portions 8,9 as represented by dotted lines 3 in Figure 2. The central strip 21 would correspond to the opening in the toner cartridge wall so that when the strip 21 is severed from the portions 8, 9 the opening in the cartridge wall will be exposed.

As shown in Figure 2, beneath the layer 20 there is a rectangular window-like foam layer or insert 35 with recesses or openings 36 cut-out from the lateral end portions corresponding to the ends 5,6 of the central strip 21. The upper and lower faces A,B of the insert 35 are provided with layers of glue. The lower glue face A of the insert 35 is covered with a peelable layer 23 and is intended to bond with the toner cartridge wall. The upper glue face B bonds to the layer 20.

The layer 20 has a rigid support 30 forming an upper layer of the seal 2 on its upper face 29. The support 30 can be made from cardboard.



When the seal 2 is installed and placed on the toner cartridge the foam insert 35 is pressed so the glue layer A bonds onto the wall of the cartridge. The lateral portions 8,9 of the seal layer 20 are likewise pressed against the toner cartridge and are bonded to the glue layer B whereby the binding force of the parts of the seal 2 which are not intended to be torn off on the toner cartridge is higher than the binding force of the strip 21.

In the embodiment shown, which is a preferred one, the tongue 4 adjacent to the first end 5 of the strip 21 can be curved to extend to the recess or opening 36 of the foam insert 35 so as to limit or avoid that the foam insert 35 exerts any appreciable binding force on the central strip 21 or on the tongue 4. The recesses 36 in the foam insert 35 located adjacent to the ends 5,6 of the central strip 21 also facilitate the tearing of the strip 21 at the beginning and the end of the tearing operation.

The cardboard support 30 is suitable for the placement of the seal 2 on the cartridge (after removal of the peelable or protective sheet 23). The support 30 has advantageously one or two parts 31, 32 which can be folded (folding lines 33,34), so as to give more rigidity to the support 30 and so as to facilitate the placement or the removal of the support 30 after placement of the seal 2. Preferably the two parts which are able to be folded are located along two lateral edges of the seal. The support 30 is also provided with a glue layer for linking or attaching the rest of the seal 2 thereon. The glue layer on the support 30 has a gluing force

...which is lower to the gluing force of the glue layer A for attaching the seal 2 to the toner cartridge.

Reference is directed to UK patent application 95 09212.8 (GB 2289238A) "the parent application" which contains subject matter common to this application. The parent application has a claim defining a seal in the following terms.

A seal for use with a toner cartridge of the type used in printers, copying machines and facsimile machines which has an opening in a wall for allowing the passage of the toner; said seal including a layer or film for location over the wall to cover and close the opening, the layer or film possessing two lateral portions and a central separable portion located between said two lateral portions said central portion extending between a first and a second end and being attached at the first end to a tongue sufficiently long so as to be brought adjacent the second end of the central portion for pulling and tearing the central portion after exerting an initial pulling force, from the first to the second end to create an opening between the lateral portions which can communicate with the opening in the cartridge wall to allow the passage of the toner, exposable gluing means for attaching the seal to the wall of the cartridge and one or more reliefs adjacent the first end of the central portion to define the location of the separable portion and to facilitate the removal of the central portion by pulling, by decreasing the initial force when required the tongue is pulled.

### Claims

1. A seal usable to permit the re-charging of a toner cartridge of the type used in printers, copy machines and facsimile machines, which has an opening in a wall for allowing the passage of the toner, said seal (2) comprising a layer from which a strip (21) can be torn out so as to expose the opening for the passage of toner with respect to parts (8,9) of the layer which remain in place, said strip (21) being linked to a grippable tongue (4) to be pulled for tearing the strip (21) from a first end (5) of the strip up to another end (6) of the strip, whereby when the first end (5) of the strip (21) is not pulled so the strip (21) is not torn, the strip (21) prevents the loss of toner from the cartridge, while when the strip (21) is torn up from the first other end to the opening (1) for the passage of toner is formed, said seal having an exposable first glue layer (A) intended to contact the toner cartridge and a substantially rigid support (30), suitable to place the seal (2) on the toner cartridge and bonded to another part of the seal with another glue layer, whereby the other glue layer exerts a gluing force between the support (30) and the other part of the seal (2) which is lower than the gluing force of the first glue layer between the seal and the toner cartridge, so that after placing and bonding the seal, the support (30) can be removed without damaging the remainder of the seal.
2. A seal according to claim 1, wherein the first glue layer (A) extends predominately along the edges of the seal and a central part of the seal corresponding to the strip (21) is free of glue.

3. A seal according to claim 1 or 2, wherein the first glue layer (A) is formed on one face of an insert (35) and the insert (35) has a further glue layer (B) for bonding to the layer (20) with the strip (21), the bonding force of the first glue layer (A) being greater than the bonding force of the further glue layer (A).
4. A seal according to claim 3, wherein the insert (35) is made from foam.
5. A seal according to claim 3 or 4, wherein the insert is of rectangular window-like shape with recesses (36) corresponding to the first and other ends of the strip (21).
6. A seal according to any one or more of claims 1 to 5, wherein the first glue layer (A) is covered by a protective element (23) intended to be removed before the placement of the seal.
7. A process of recharging a toner cartridge of the type used in printers, copy machines and facsimile machines which has an opening in a wall for allowing the passage of the toner which comprises introducing toner into the cartridge through the opening, fixing a seal according to any one of claims 1 to 6 on to the wall to cause the first glue layer (A) to bond with the wall and seal the opening and removing the support from the remainder of the seal.



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Application No: GB 9806849.7  
Claims searched: 1-7

Examiner: A J Rudge  
Date of search: 12 June 1998

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): B6C(CBG);B8D(DCE,DCF12,DCF20,DCG)

Int Cl (Ed.6): B65D-017/28;G03G-015/08

Other: ONLINE -WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
A	US 5296902 (Michlin)	
A	US 5177540 (Canon)	
A	US 5110646 (Prestel)	
A	EP 0638851A2 (Canon)	
A	EP 0631207A2 (Canon)	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.